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Addendum 5 to the Remedial Investigation Work Plan
Response Action for PCB-Impacted Soil
Operable Unit 2

Former Frenchtown Mill
Missoula County, Montana

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NewFields

Version 3
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ADDENDUM 5 TO THE REMEDIAL INVESTIGATION WORK PLAN
Response Action for PCB-Impacted Soil, Operable Unit 2
Former Frenchtown Mill, Missoula County, Montana

Version 3
Issued: September 28, 2017

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Date

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Date

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1.0 INTRODUCTION

This Remedial Investigation Work Plan (RIWP) Addendum describes a proposed action to remove soils containing Polychlorinated Biphenyls (PCBs) from Operable Unit 2 (OU2) of the Former Frenchtown Mill (hereafter referenced as the "site"; **Figure 1**). This plan is Addendum No. 5 to the RIWP (NewFields, 2015a).

1.1 BACKGROUND

Initial investigation of PCB concentrations in soil of OU2 was completed in 2015 (NewFields, 2016). A subsequent targeted investigation in 2016 identified PCBs in soils at elevated concentrations in the vicinity of the High Density Pulp Tank (HDPT) and the Transformer Storage Building (TSB) (NewFields, 2017). The HDPT and TSB areas are shown on **Figure 2**. In the HDPT area, only Aroclor 1260 was detected. In the TSB area, Aroclors 1254 and 1260 were detected. Historical sampling locations are shown on **Figure 3** (HDPT area) and **Figure 4** (TSB area). Historical results for PCBs in soil of OU2 are summarized in **Table 1**.

PCB concentrations in soil were above Residential Direct-Contact Regional Screening Levels (RSLs) in surface soil (0 to 2 feet below ground surface (bgs)) samples SS18, SS19, HDPT38, and HDPT40 in the HDPT area (**Figure 3**), as well as surface soil samples SS28, TSB46, and TSB47 in the TSB area (**Figure 4**).

1.2 REMEDIAL PURPOSE AND PROPOSED CLEANUP LEVELS

The purpose of the proposed remedial action is to prevent unacceptable human exposure to PCBs by removing and disposing of soil from areas of OU2 where elevated PCB concentrations have been identified. Proposed PCB soil cleanup levels are presented in **Table 2**. The proposed cleanup levels are:

- Residential direct-contact RSLs for surface soil from 0 to 2 feet – 0.12 milligrams per kilogram (mg/kg) (Aroclor 1254) and 0.24 mg/kg (Aroclor 1260).
- Construction worker RSLs for subsurface soils (> 2 feet) – 0.97 mg/kg (Aroclor 1254) and 0.99 mg/kg (Arclor 1260).

Proposed soil cleanup levels are consistent with the U.S. Environmental Protection Agency (EPA) conservative and protective approach to selection of soil cleanup levels (EPA, 2002). Soil cleanup levels for the proposed remedial action are based on a target excess cancer risk of $1x10^{-6}$ and a target non-cancer hazard quotient of 0.1. For surface soil (0 to 2 feet bgs), residential direct-contact soil screening levels are proposed as cleanup levels and are protective of all uses despite the intent to redevelop OU2 as commercial/industrial land. For subsurface soil (greater than 2 feet bgs), construction worker soil screening levels are proposed as cleanup levels. Use of the construction worker exposure scenario for subsurface soil is consistent with EPA guidance regarding cleanup levels (EPA, 2004). In addition, use of construction worker exposure scenario for subsurface soil is consistent with guidance from MDEQ (2012), which states, "When evaluating current and future exposure…DEQ considers soils from 2 – 10 feet below ground surface as short-term excavation or construction worker exposures."

2.0 PROPOSED SOIL RESPONSE ACTION

The proposed response action consists of excavation to remove soil containing PCBs at concentrations above select soil cleanup levels. The two areas proposed for excavation were identified during an EPA approved site investigation completed in 2015 (NewFields, 2016). Excavation is proposed in areas and depths consistent with the site investigation findings. Proposed excavation areas and depths are shown on **Figures 3 and 4**. Tasks for the response action include:

- Identification and sampling of clean backfill prior to use;
- Excavation of concrete and debris to allow access to impacted soils;
- Excavation and disposal of PCB- impacted soils;
- Confirmation sampling;
- Backfilling.

Excavation in the HDPT area would occur inside the HDPT foundation. Excavation in the TSB area would occur immediately adjacent to the TSB foundation. Soil would be hauled using tarped trucks under manifest to the Missoula Landfill, and the excavation areas would be backfilled with clean coarse-grained material. Greater detail regarding the proposed response action is provided below.

Methods previously described in planning documents approved by EPA will be employed during the response action. This includes standard operating and quality control procedures described in the Field Sampling Plan included in the RIWP (NewFields, 2015b), and the Quality Assurance Project Plan (NewFields, 2015c). Site safety will be employed in accordance with the EPA-approved Health and Safety Plan (NewFields, 2015d). Standard Operating Procedures (SOPs) relevant to the proposed response action are provided in **Appendix A**.

2.1 SAMPLING BACKFILL MATERIAL

One five-point composite sample of the proposed backfill material will be collected and analyzed for PCBs (prior to use) to ensure that soil used to backfill the excavations does not contain PCBs above proposed cleanup levels. The sample will be collected in accordance with SOP-13 (**Appendix A**), and will be packaged and shipped under chain-of-custody to Pace Analytical of Minneapolis, Minnesota for PCB analysis by EPA Method 8082.

2.2 EXCAVATION OF CONCRETE AND DEBRIS

Prior to excavation, obstructions and debris will be removed from the proposed excavation areas. During excavation, some of the foundation for the former HDPT may be removed to provide access to impacted soil as the excavation progresses to full depth in the areas shown on **Figure 3**.

2.3 SOIL EXCAVATION

In the HDPT area (**Figure 3**), the excavation depth will vary based on previous sampling results. Soils will be excavated to 4 feet bgs in the southwestern portion of the HDPT foundation to remove surface soil in the vicinity of borehole 40, 38, SS18, and SS19, and to a depth of 8 feet bgs in the southwestern portion of the HDPT foundation to remove soil near borehole 39. In the TSB area, excavation is proposed in an area approximately 9 feet by 10 feet, and 3 feet deep (**Figure 4**) to remove PCB-impacted soil near

sample SS28 and boreholes 46 and 47. Proposed excavation depths in both the HDPT and TSB areas are approximately 2 feet below the deepest sample with PCB concentrations above cleanup levels to ensure impacted soils are removed. Excavation depths shown on **Figures 3 and 4** are the excavation total depths.

The ground surface and pit bottom footprints of each excavation will be measured and documented in the field using both a measuring wheel accurate to the nearest 0.1 feet and a GPS device with actual field precision of approximately 1 foot for individual points. Excavation depths will be measured using a laser level and survey rod accurate to within 0.2 feet, with one station used per excavation. Excavation depths shown on **Figures 3** and **4** are the proposed total depths. Excavation depths and/or areas will increase if confirmation samples indicate further PCB contamination.

2.4 Disposal and Backfill

Waste soil and debris from the response actions will be hauled by truck (tarped) to the Missoula Landfill operated by Republic Services. The soils will be disposed of as Special Waste. Each load of material will be accompanied by a manifest documenting custody and disposal of the material, as well as weight of the material. A map of the transportation route to the landfill and a contingency plan on how to handle the waste if it was to be spilled on the roadway during transportation to the landfill are provided in **Appendix B**.

The excavation areas will not be backfilled with clean materials until the results from the confirmation sampling are provided to EPA and EPA provides approval to begin the backfilling. If after confirmation sampling, results are not below cleanup levels, additional excavation will take place until confirmation sampling indicates PCB concentrations in soil are below cleanup levels.

Each excavation area will be backfilled with coarse-grained material shown not to contain elevated concentrations of PCBs above EPA Residential RSLs. The material will be placed in lifts up to 18-inches thick and compacted using the excavator bucket.

2.5 Data Quality Objectives and Confirmation Sampling

Table 3 presents the Data Quality Objectives (DQOs) for soil confirmation sampling after response action at the site. EPA's Seven-Step Planning Approach (EPA, 2006) was used to identify the DQOs. Based on historical sample results summarized in **Table 1** and shown on **Figure 3 and 4**, data gaps for PCBs for the two areas include:

- Presence/absence of PCB impacts beneath the concrete slab of the former TSB;
- Depth of PCB impacts in the southeastern portion of the HDPT foundation near borehole 39; and
- Lateral extent of PCB impacts to soil to the northwest, northeast, and southeast from the impacts observed in boreholes 38 and 39 in the HPDT area.

Confirmation samples from the excavations will fill these data gaps. After excavation in both areas, discrete soil samples will be collected from the sidewalls and pit bottoms of the excavations to evaluate whether remaining PCB concentrations in soil are below cleanup levels (**Table 2**). Sidewall samples will be collected at a minimum frequency of one for every 20 linear feet of sidewall, and excavation bottom samples will be collected at a frequency of one for every 625 square feet of excavation bottom. Resulting sampling frequency will also be no less than four evenly-spaced sidewall samples and one excavation bottom sample per excavation. The resulting sampling frequency will be four sidewall samples and one excavation bottom sample for the TSB excavation (which is square and less than 10 feet on each side), and five sidewall samples and two excavation bottom samples for the HDPT excavation (which round and approximately 30 feet wide).

Confirmation samples will be collected from excavation surfaces using a stainless steel trowel, or excavator bucket when collected at depths greater than 4 feet below ground surface. Procedures for sample collection are detailed in the discrete soil sampling section of SOP-13 and the excavations section of SOP-14 (**Appendix A**). Detailed sample handling procedures for chain of custody (SOP-3) and packaging/shipping (SOP-4) will be followed as stipulated in **Appendix A**. Confirmation soil samples will be transferred to laboratory-provided 8-ounce glass jars with Teflon®-lined lids, stored in a cooler with ice, and then shipped under chain of custody to Pace Analytical of Minneapolis, Minnesota. The confirmation samples will be analyzed for PCBs by EPA Method 8082. Requirements for containers, preservation, and hold times for samples collected are shown in **Table 4.** All samples submitted for laboratory analysis will be analyzed using standard turnaround times.

2.6 Decontamination Procedures

All non-disposable field equipment that will be used for soil sampling, including the excavator before use and between excavation of soils from the two areas, will be decontaminated in accordance with the applicable section of SOP-2 (**Appendix A**). A list of field equipment to be used during this investigation is provided in SOP-13 (**Appendix A**). To prevent cross-contamination, all non-disposable sampling (small) equipment will be decontaminated between sampling locations using distilled water, alconox detergent, and a hexane rinse in accordance with EPA (2011) guidance. Revised SOP-2 (**Appendix A**) specifies the use of hexane. Disposable equipment intended for one-time use will not be decontaminated, but will be disposed of as described in SOP-2.

To prevent inadvertent contamination during transport of PCB-impacted soils, trucks will be tarped during transport to and from the landfill. In addition, the wheels on each truck will be dry decontaminated in a designated area prior to leaving the site, and the excavator bucket will be dry decontaminated prior to movement away from each excavation area. If dry decontamination is not sufficient due to wet conditions or caking of material on the truck tires, a wet decontamination will be performed on the concrete slab for the Transformer Storage Building Foundation (**Figure 2**), which has a closed sump to collect decontamination water. To dispose of the water, it will be periodically pumped onto the soil in the truck and hauled to the landfill. In addition, soils will be excavated and loaded directly into trucks to minimize the potential spread of PCBs during soil handling.

2.7 Quality Assurance and Quality Control (QA/QC)

QA/QC procedures will be followed in accordance with the Quality Assurance Project Plan (QAPP) which was included as Appendix E of the RIWP (NewFields, 2015c) and CERCLA QAPP guidance. In accordance with the QAPP, field quality control samples will include a field duplicate (FD), and an equipment rinse blank (ERB). The field quality control samples will be collected in accordance with SOP-24 (**Attachment B**), and will be analyzed by EPA Method 8082. One additional sample container will be collected for the use as in site-specific Matrix Spike (MS) testing. The sample container will be from the same homogenized material used for the FD.

2.8 Field Documentation

NewFields personnel will document all activities in accordance with SOP-1 (**Appendix A**). A daily field record will be completed, as well as to-scale field drawings showing excavation and sampling locations, and log of photographs. Example forms for daily field record and photograph log are provided in **Appendix C**.

2.9 Data Validation and Reporting

Analytical data will be verified and validated in accordance with the approved QAPP (Appendix E of the RIWP; NewFields, 2015c). Results will be organized in a NewFields data management system and then uploaded to the SCRIBE project database in accordance with procedures outlined in the QAPP and the technical memo submitted to EPA on May 6, 2016 (NewFields, 2016).

A response action report will be prepared and submitted to EPA on behalf of the PRPs upon completion of excavation and laboratory analysis. The report will document the locations/depths of excavation, the methods and results of confirmation sampling, backfill material, and disposal (including landfill weight tickets and manifests). The report will evaluate the data with respect to the DQOs outlined in **Table 3** and compare confirmation samples to soil cleanup levels. Field drawings of excavation and sampling locations, and analytical data tables will be appended to the report along with figures showing the excavation. Data validation summaries and laboratory analytical reports will also be included in the report as well as field notes and sampling forms.

3.0 HEALTH AND SAFETY

Staff overseeing excavation and collecting samples will complete work in accordance with the approved Health & Safety Plan (Appendix F of the RIWP; NewFields, 2015d). The HASP will be complemented by a Job Safety Analysis (JSA) worksheet to address safety concerns related specifically to overseeing excavation and collection of soil samples. Field team leaders will conduct daily staff safety meetings guided by the HASP and JSA at the beginning of each work day.

4.0 SCHEDULE

NewFields will schedule the response actions in general accordance with the milestones shown below. It's anticipated that this Addendum will be approved by EPA in August 2017 and all work will be completed in 2017.

Milestone	Schedule for Completion (business days)
EPA Approval of Addendum 5 to RIWP	Day 0
Schedule Excavation Contractor, Order Sampling Containers, Sample Proposed Backfill	Day 5
Request Utility Locate	Day 15
Initiate Excavation	Day 20
Complete Excavation and Confirmation Sampling	Day 22
Ship Samples	Day 23
Receive Laboratory Results from Confirmation Samples	Day 37
Complete Backfill	Day 50
Submit Response Action Report	Day 60

5.0 REFERENCES

Environmental Protection Agency (EPA), 2002. *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*, Office of Solid Waste and Emergency Response. December.

EPA, 2004. *Guidance on Surface Soil Cleanup at Hazardous Waste Sites: Implementing Cleanup Levels - Draft*, Office of Emergency and Remedial Response. May.

EPA, 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process*. EPA QA/G-4. February.

EPA, 2011. *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs) - Revision 4*, Office of Environmental Measurement and Evaluation. May.

Montana Department of Environmental Quality (MDEQ), 2012. *Voluntary Cleanup and Redevelopment Act Application Guide*. April.

NewFields, 2017. *PCB Soils Investigation Report, Operable Unit 2, Former Frenchtown Mill, Missoula County, Montana*. February.

NewFields, 2016. *Preliminary Data Summary Report, November/December 2015 Sampling Event, Smurfit Stone/Frenchtown Mill, Missoula County, Montana.* September.

NewFields, 2015a. *Remedial Investigation Work Plan, Smurfit Stone/Frenchtown Mill, Missoula County, Montana.* Prepared for International Paper Company, M2Green Redevelopment, LLC, and WestRock CP, LLC. November.

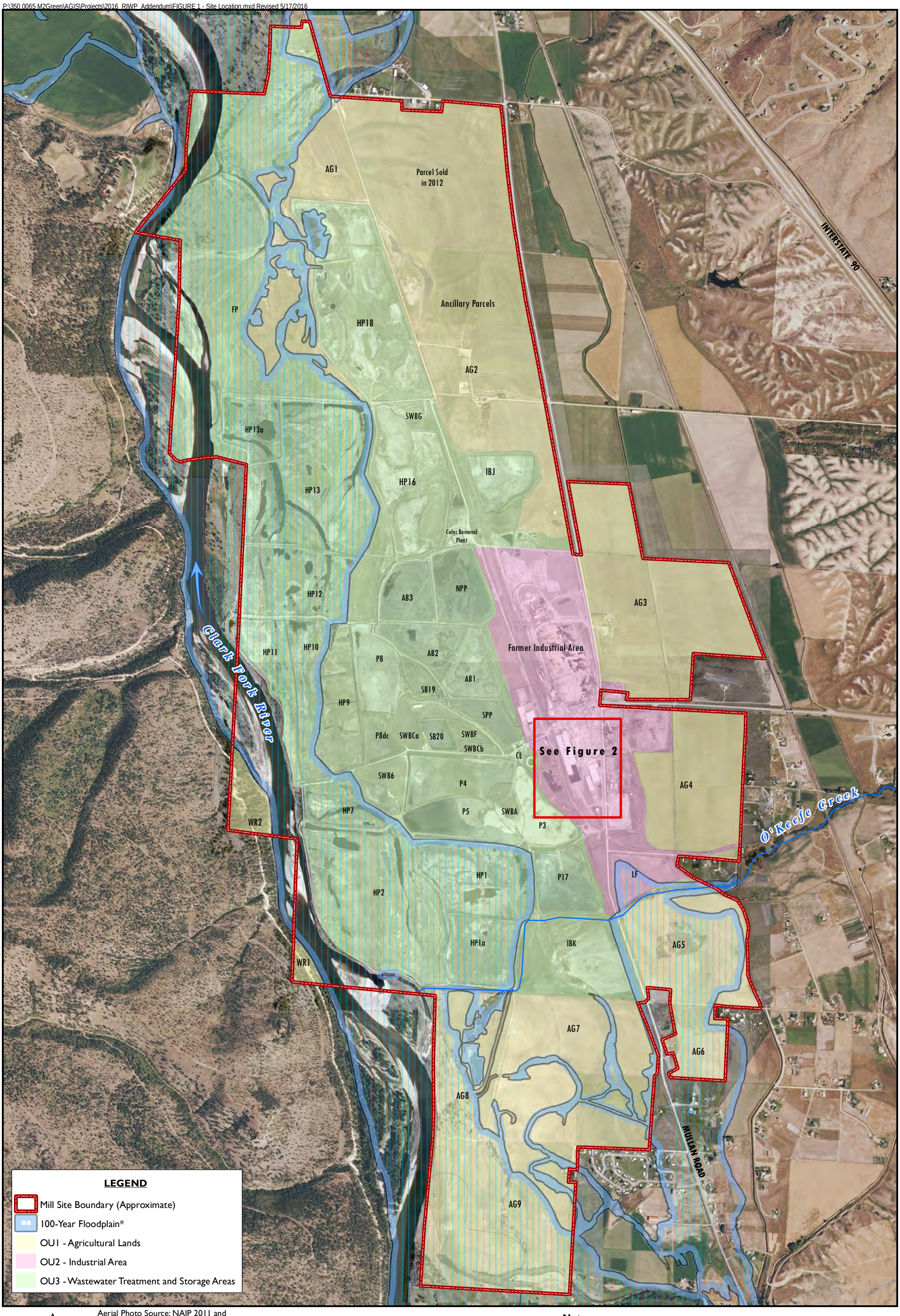
NewFields 2015b. *Field Sampling Plan for the Smurfit Stone / Frenchtown Mill Site, Missoula County, Montana. Version 2, 11/09/2015*. Included as Appendix D of the Remedial Investigation Work Plan, November 2015.

NewFields 2015c. *Quality Assurance Project Plan for the Smurfit Stone / Frenchtown Mill Site, Missoula County, Montana. Version 2, 11/05/2015.* Included as Appendix E of the Remedial Investigation Work Plan, November 2015.

NewFields 2015d. *Health and Safety Plan for the Smurfit Stone / Frenchtown Mill Site Remedial Investigation, Missoula County, Montana. Version 1.0, 11/10/2015.* Included as Appendix F of the Remedial Investigation Work Plan, November 2015.

FIGURES

P:\350.0065.M2Green\AGIS\Projects\2016_RIWP_Addendum\FIGURE 1 - Site Location.mxd Revised 5/17/2016



Aerial Photo Source: NAIP 2011 and Newfields 2016 (Within Site Boundary)

0 1,600 Feet

NewFields

*Floodplain Source:
As defined by the Federal Emergency Management Agency (FEMA) 2013 Digital Flood Insurance Rate Map (DFIRM). (NFIP 2013)

Notes

AG - Agricultural Land
AB - Aeration Stabilization Basin
CL - Clarifyer
FP - Flood Plain
HP - Holding or Storage Pond
IB - Rapid Infiltration Basin
LF - Landfarm
NPP - North Polishing Pond
P - Settling Pond
SB - Spoils Basin
SPP - South Polishing Pond
SWB - Solid Waste Basin
WR - West of River

Site Location
Former Frenchtown Mill Site
Missoula County, Montana
FIGURE 1

P:\350.0065.M2Green\AGIS\Projects\2016_RIWP_Addendum\FIGURE 2 - Proposed Sample Areas.mxd Revised 7/28/2017

Aerial Photo Source: Newfields 2016

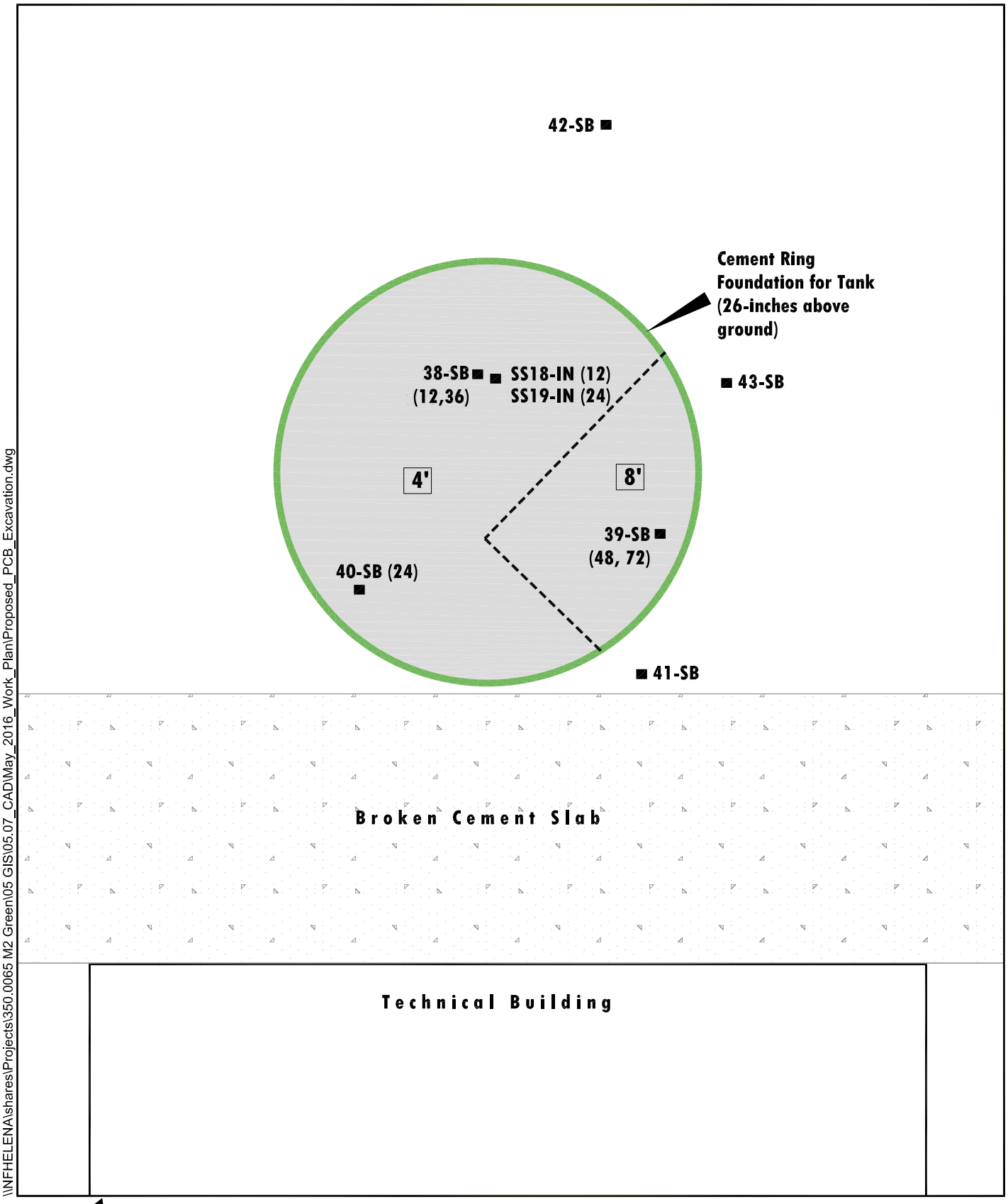
N

0 200
Feet

OU2 - Industrial Area Boundary

NewFields

PCB Impacted Areas (OU2)
Former Frenchtown Mill Site
Missoula County, Montana
FIGURE 2



\\NFHELENA\shares\Projects\350.0065 M2 Green\05 GIS\05.07_CAD\May_2016_Work_Plan\Proposed_PCB_Excavation.dwg

North

0 Feet 10

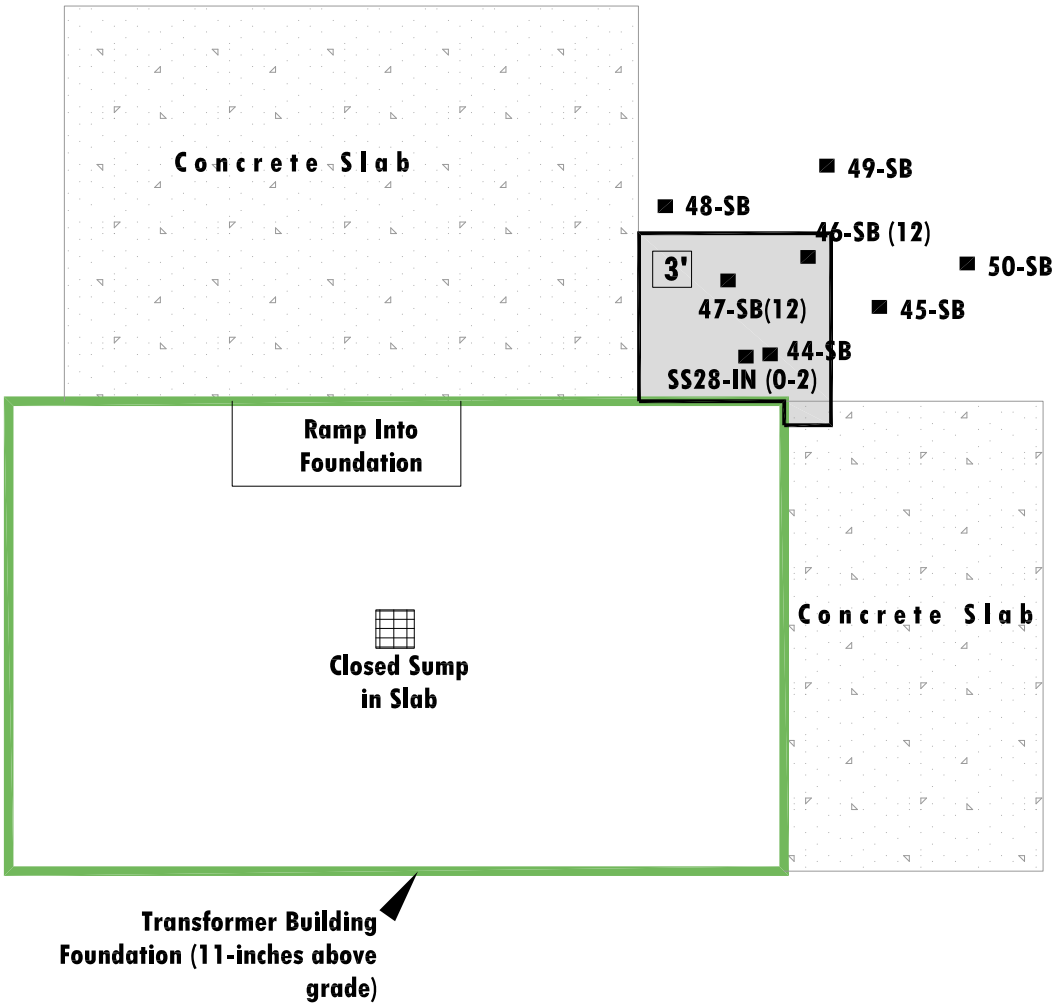
■ Soil Sample Locations (depth of soil sample with PCB concentrations above screening level, inches below grade)

Proposed Excavation

8' Proposed Excavation Depth in Feet

NewFields

Proposed Excavation Footprint
High Density Pulp Tank Area
Former Frenchtown Mill
Missoula County, Montana
FIGURE 3



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North

0 Feet 10

NewFields

■ Soil Sample Locations (depth of soil sample with PCB concentrations above screening level, inches below grade)

Proposed Excavation

3' Proposed Excavation Depth in Feet

Proposed Excavation Footprint
Transformer Storage Building Area
Former Frenchtown Mill
Missoula County, Montana
FIGURE 4

TABLES

TABLE 1

Summary of Soil Sample Results By Depth
PCB Investigation (OU2)
Former Frenchtown Mill, Missoula County, Montana

SAMPLE ID	High Density Pulp Tank (HDPT) Area							Transformer Storage Building (TSB) Area										
	Soil Sample							Soil Sample										
	SS18-IN-(12) SS19-IN- (24)	IN-HDPT38-SB-1,2,3,4	IN-HDPT39-SB-1,2,4,6	IN-HDPT40-SB-1,2,3,4	IN-HDPT41-SB-1,4	IN-HDPT42-SB-1,2,4,5	IN-HDPT43-SB-1,2,5,6	SS28-IN-(0-2)c	SS29-IN-(0-2)c	SS30-IN-(0-2)c	SS31-IN-(0-2)c	IN-TSB44-SB-1,2,3	IN-TSB45-SB-1,2,3	IN-TSB46-SB-1,2,3	IN-TSB47-SB-1,2,3	IN-TSB48-SB-1,2,3	IN-TSB49-SB-1,2,3	IN-TSB50-SB-1,2,3
	Inside Ring				Outside Ring													
SAMPLING DEPTH (feet) 1	**1440** ND	614	42.9	70.7		H	H	**7490 J**	154 J	37.7 U	88.1 J	15.2	ND	66.7	ND	H	H	H
2	**1740** ND	126	ND	747	65.8									156	893			
3		**1020**				H	H					14.8	H			H	H	H
4		17.1J										H	H	H	H	H		
5			**2840**		172	H											H	H
6			**1470**	125		H	H											
7				50.3														
8																		
9																		
10																		

Notes:

156 - Blue font; Aroclor 1254 concentration in µg/kg, if not shown, result is ND with reporting limig of 34.5 µg/kg

1020 - Black font; Aroclor 1260 concentration in µg/kg

H - Held, not analyzed

HDPT - High Density Pulp Tank

TSB - Transformer Storage Building

Sample depths are based on professional judgment due to poor sample recovery in sampling sleeve.

Sample locations are shown on Figure 3 (HDPT) and Figure 4 (TSB)

ID - identification

J - Concentration is considered estimated.

ND - Not Detected

QA/QC - Quality Assurance/Quality Control

µg/kg - micrograms per kilogram, or parts per billion

OU - Operable Unit

- initial soil samples collected in 2015
- soil samples collected in 2016
- not investigated

Bold - exceeds the construction worker direct contact screening level of 990µg/kg (Aroclor 1260) or 970 µg/kg (Aroclor 1254).

Underline - sample from 0 to 2 feet, and exceeds residential direct contact screening level of 240µg/kg (Aroclor 1260) or 120 µg/kg (Aroclor 1254).

..... depth driven by sample sleeve

____ total depth of borehole

Table 2

Proposed Cleanup Levels

Response Action for PCB-Impacted Soil, Operable Unit 2

Frenchtown Mill Site, Missoula County, Montana

Contaminants of Concern (COCs)	Proposed Cleanup Levels (µg/kg)	
	Surface Soil (0-2 feet bgs), Residential RSLs	Subsurface Soil (>2 feet bgs), Construction Worker RSLs
Aroclor 1254	120	970
Aroclor 1260	240	990

Notes:

bgs - below ground surface

ug/kg = micrograms per kilogram

RSLs = EPA Regional Screening Levels assuming cancer risk of 10^{-6} and hazard quotient of 0.1.

TABLE 3

Data Quality Objectives: Confirmation Sampling After Excavation of PCB-Impacted Soil

Former Frenchtown Mill Site, Missoula County, Montana

Step 1: Problem Statement	Step 2: Identifying the Decisions	Step 3: Decision Inputs	Step 4: Study Boundaries	Step 5: Decision Rules	Step 6: Tolerance Limits on Errors	Step 7: Optimization of Sample Design
Historical operations at the Mill have resulted in Polychlorinated Biphenyl (PCB) impacts to soil in the vicinity of the High Density Pulp Tank (HDPT) and Transformer Storage Building (TSB) areas within Operable Unit 2 (OU2). Excavation is proposed to eliminate these impacts. Post-excavation data is needed to verify whether excavation was effective.	Are PCBs present in soil of OU2 at concentrations that pose a threat to human health under current or reasonably anticipated future land use?	Concentrations of PCBs in soil samples from the pit bottom and sidewalls of excavations in the HDPT and TSB areas. Contaminants of Concern (COCs) are PCBs (Aroclor 1254 and Aroclor 1260).	Soil sampling will be performed from the pit bottoms and sidewalls of excavations in the HDPT and TSB areas of OU2.	After excavation, are PCBs present in remaining soil at concentrations above cleanup levels? Proposed cleanup levels are the EPA residential Regional Screening Levels (RSLs) for surface soil (0 to 2 feet below ground surface) and the EPA construction worker RSLs for subsurface soil (deeper than 2 feet below ground surface).	Quality assurance and quality control procedures will be conducted and data validation will be performed in accordance with the Quality Assurance Project Plan approved by the EPA. Acceptance criteria for the data collected as part of this study are outlined in the QAPP.	Sidewall soil samples will be collected in all cardinal directions, including to the south under the TSB foundation. Pit bottom soil samples will be collected from the center of each excavation area at a frequency of one sample for every 625 square feet or less.

Table 4

Laboratory Methods, Containers and Preservatives
Confirmation Sampling After Excavation of PCB-Impacted Soil
Frenchtown Mill Site, Missoula County, Montana

Parameter Group	Analytical Method & Parameters	Number of Containers	Container Type	Preservation	Hold Time
Polychlorinated Biphenyls (PCBs)	**8082;** PCBs (Aroclors 1254 and 1260)	7 (HDPT Area) + 5 (TSB Area) + 1 Homogenized Field Duplicate + 1 Rinsate Blank + 1 Container for Matrix Spike = 15 Total	8 ounce glass jar	Cool to 6°C but above freezing	Extract within 1 year of sample collection. Analyze within 40 days of extraction.

Notes:

°C - degrees celsius
HDPT - High Density Pulp Tank
TSB - Transformer Storage Building

APPENDIX A

Standard Operating Procedures (SOPs) Extracted from the EPA-Approved Quality Assurance Project Plan

STANDARD OPERATING PROCEDURES TABLE OF CONTENTS	
SOP	**TITLE**
1	Field Log Book and Field Sampling Forms
2	Equipment Decontamination
3	Sample Nomenclature, Documentation, and Chain-of-Custody Procedures
4	Sample Packaging and Shipping
13	Surface Soil Sampling
14	Subsurface Soil Sampling
22	Management of Investigative-Derived Waste

SOP-1

FIELD LOG BOOK AND FIELD SAMPLING FORMS

Pertinent field investigation and sampling information should be recorded on a daily field log book and appropriate sampling forms to provide a continual record of actions taken each day on the site. Each employee is responsible for completing a record of the day's activities in a log book and field forms of sufficient detail such that someone can reconstruct the field activities without relying on the memory of the field crew. Field Books will be bound, with consecutively numbered pages and all information must be recorded with permanent ink. If changes need to me made within the field book, a single strikethrough line will be used to mark out incorrect information. Initials of the employee making the corrections and the date of the correction must accompany the strikeout. At a minimum, daily entries on the field log book shall include, as appropriate:

- Project and client name
- Date, times and locations.
- Purpose of the field effort
- Names of field crew leader and team members present on the site, and other site visitors
- Description of site conditions and any unusual circumstances, including weather conditions
- Details of actual work performed, particularly any deviations from the field work plan or standard operating procedures
- Location of sample site, including map reference, if relevant
- Field observations including documentations of conditions and procedures used when collecting, handling or treating samples.
- Field measurements made (e.g., PID readings, pH, temperature) on appropriate forms.
- Date and time of initiation and cessation of work.

Purpose

To provide guidance on how to document activities completed in the field by NewFields employees

Goal and Objective

To provide a record of our project work and the decisions made in the field

Equipment Needs

Field Note Book
Field Sampling Forms
Permanent Writing Utensils
Camera

Specific details for each sample collected should be recorded using NewFields standardized field forms. These field forms contain blank queries to be filled in by field personnel. Items typically recorded on field sampling forms consist of the following:

- Sample name
- Time and date samples were collected
- Number and type (media; natural, duplicate, QA/QC) of samples collected
- Analysis requested
- Sample depth

- Sample preservative (if applicable) and volume
- Sampling method, particularly any deviations from standard operating procedures
- Additional field observations, including collection of field parameters
- Decontamination procedures (if applicable)
- Photo documentation; including a photo board in the photograph with details such as date, time and location or an accompanying photo log with descriptions, dates, and times.
- Signature of sampler

The field log book and field data sheet must be signed on a daily basis by the author of the entry. Upon completion of the field effort, the original field forms will be electronically scanned and both hard copies and electronic documents will be filed in their respective project file. Photocopies of the original field forms can be made and used as working documents.

SOP-2

EQUIPMENT DECONTAMINATION

Decontamination of field equipment is necessary to prevent cross contamination between sites to be investigated and sampling locations on a site. Decontamination should be performed on all non-dedicated and non-disposable sampling equipment that may contact potentially contaminated media.

The following should be done to decontaminate field sampling equipment:

- Set up a decontamination area, preferably upwind from the contaminated zone to reduce the potential for windborne contamination.
- Wear disposal gloves while decontaminating equipment.
- Prior to initiating decontamination, visually inspect sampling equipment for evidence of contamination; use stiff brush to remove visible material.
- Once rough brushing is complete, decontaminate each piece of equipment following a sequential process of washing with Liquinox or an equivalent degreasing detergent; rinsing with distilled water; rinsing with 10% dilute nitric acid, methanol, or hexane (dependent upon Contaminant of Concern (COC)); and finally rinsing with distilled water three times. Best procedure is to set up wash tubs for each of the above processes.
- Rinse equipment with methanol instead of nitric acid if sampling for organic contamination.
- Decontaminated equipment that is used for sampling organics should be wrapped in aluminum foil or another inert material if not used immediately.

The following should be done for oversized equipment, such as drilling rigs, excavators, and haul trucks:

- Prior to exiting the excavation area, the equipment operator will ensure that the equipment is inspected for adhering soil or other material. Visible soil adhering to equipment will be removed using dry decontamination techniques (shovels and brooms) as necessary to prevent cross-contamination of the site during site work.

- If dry decontamination techniques cannot remove visible soil, in a designated decontamination area, high pressure

Purpose

The purpose of this SOP is to describe general decontamination procedures for field equipment

Goal and Objective

To sufficiently clean field equipment to prevent cross contamination between sites and sample locations

Equipment Needs

5-gallon plastic tubs/buckets
Distilled water
10% Nitric Acid rinse (if metals are COC)
10% Methanol (if organic COC are present)
Hexane (if PCBs are COC)
Liquinox Soap
Hard Bristle Brush
Garbage Bags
Disposable Gloves
Paper Towels
55-gallon drums (optional depending on need to containerize wash water)
High pressure washer*
Tap Water*
*(for oversize equipment)

wash with heated tap water will be used to clean the portions of equipment that contact soil (i.e. tracks, auger flights, wheels and excavator buckets). For haul trucks, special attention must also be given to mud flaps, wheel wells, undercarriage, and foot surfaces (cab floor, control pedals, or walking boards).

- If rinseate generated during the decontamination process requires containerization, establish a lined decontamination area and move equipment into this area during decontamination. Rinseate should either be tested and managed accordingly (see below), or loaded on to trucks hauling contaminated soil/waste from the same source for disposal. If testing indicates the rinseate is not hazardous waste and would not cause or contribute to excess health risks or groundwater concerns, rinseate may be allowed to infiltrate into the ground.

Where water is used in decontamination of oversize equipment, the vehicles will be held in the area for at least 2 minutes after completion of washing to allow for collection of drippings in the designated area.

All disposable items (e.g., paper towels, latex gloves) should be deposited into garbage bags and disposed as Class II common refuse, unless investigating a site known to contain hazardous wastes. Check with the project manager before initiating investigation to confirm proper handling of disposable items. Handling and disposal procedures for rinse water, wash water, and disposable items will depend on the type of contaminant being assessed; and the project Field Sampling Plan should be reviewed to determine the process for disposal.

If equipment rinse blank samples are to be collected as part of quality control procedures, they should be collected from decontaminated sampling equipment in accordance with the project-specific Field Sampling and documented in accordance with SOP-1.

A list of materials for decontamination is provided in the text box on Page 1. The amount of distilled water and rinse solutions needed on site will depend on the number of samples to be collected and the sampling methods. For this reason, equipment needs should be evaluated prior to going in the field.

SOP-3

SAMPLE NOMENCLATURE, DOCUMENTATION, AND CHAIN-OF CUSTODY PROCEDURES

When completing sampling it is critical that the process used to label and transport samples to the laboratory for analysis is sufficient to demonstrate with confidence that the samples were collected from the location indicated, and that during transport to the lab no actions were taken to potentially alter the integrity of the samples. Without following strict sample labeling and chain-of-custody procedures, analytical data collected at a site has little to no value.

SAMPLE NOMENCLATURE

Samples should be labeled in such a way to allow a person unfamiliar with the site to understand where the samples were collected. Samples should be labeled sequentially as follows:

> General location designation - sampling method and site number – sample media type – sequential sample number and composite designation (if needed).

For example, the soil sample P3-TP1-SB-01, indicates the sample was collected in Pond 3 (P3), test pit number 1 (TP1), it was a sub-surface soil sample (SB), and it's the first sample collected (01). Discrete samples are assumed. If the sample is a composite (C), Additional designation should be added after the sequential sample number ie: P3-TP1-SB-01C.

Sediment samples are labeled similar to soils. CFR indicates the sample was collected along the Clark Fork River, these samples will be collected in either the Flood Fringe (FF) of the 100-year floodplain or subaqueous (SA) within the river channel and will be designated as sediment samples (SE). An example of the first location Flood Fringe sample in the CFR would be named CFR-FF1-SE-01. The first subaqueous sample would be named CFR-SA1-SE-01. Similarly, surface water samples would use the designation (SW) ie: (CFR-SA1-SW-01).

Purpose

To identify the specific requirements for labeling and documenting sample collection

Goal and Objective

To increase the confidence in sample locations and to submit samples to the laboratory without risk of integrity loss

Equipment Needs

Indelible ink pen

Chain-of-custody forms

Field Log Book

Field Sampling Form

Newly installed groundwater monitoring wells will be named by the field oversight person, and include NF for NewFields, followed by a designation of the well type (MW) for monitoring well, and a well number. An example groundwater sample name would be: NFMW1. If multiple groundwater samples were to be collected from NFMW1 then they should be named sequentially NFMW1-01, NFMW1-02…. .

Prior to initiating sampling, field personnel should familiarize themselves with the Field Sampling Plan and the nomenclature to be used for the site. The character prefixes in the table below are recommended for sample types.

SAMPLE DOCUMENTATION

In addition to the chain-of-custody forms discussed below, field person must keep a list of samples collected in the field in the field log book and on appropriate field sampling forms. This allows you to go back and verify sample locations and numbers should there be any confusion at a later time. Upon returning to the office, the field log book and forms should be kept in the project file and subsequent copies sent to the laboratory, or other designated parties, as needed.

Each person in the field is responsible for putting entries into the field log and sampling forms. Designating an individual from the sampling team for record keeping is fine, provided all field personnel come to an agreement as to who this will be, and the field crew leader is certain field personnel are familiar with the record keeping requirements. All entries on the log book and field sampling forms must be made in indelible ink.

Sampling Acronym	Label
EB	Equipment Blank
TB	Trip Blank
FB	Field Blank
MW	Monitoring Well
DW	Domestic Well
IW	Injection Well
OB	Observation Well
UST	Underground Storage Tank
VE	Vapor Extraction
AA	Ambient Air
SUMP	Sump (Water sample)
P	Pond
SPR	Spring
SE	Sediments
SW	Surface Water, Stream or River
SR	Surface Runoff
SA	Subaqueous
FF	Flood Fringe (Floodplain)
FW	Flood Way (Floodplain)
GR	Grab Sample
TP	Excavated Test Pit
BH	Borehole
SS	Surface Soil Sample
SB	Subsurface Soil Sample
GW	Groundwater Sample

CHAIN OF CUSTODY PROCEDURES

A chain-of-custody form must be generated for all samples collected in the field for laboratory analysis. Samples from more than one project should not be included on the same chain of custody; however, multiple samples from a specific project can be included on the same custody form.

Copies of the chain-of-custody form should be maintained in the project file. The sampler may use a NewFields' chain-of-custody form or a chain- of-custody form provided by the laboratory. Sample custody records must be maintained from the time of sample collection until the time of sample delivery to the analytical laboratory and should accompany the sample through analysis and final disposition. The information to be included on the chain-of-custody form will include, but is not limited to:

- Project number/site name
- Sampler's name and signature
- Date and time of sample collection
- Unique sample identification number or name
- Number of containers
- Sample media (e.g., soil, water, vapor, etc.)
- Sample preservative (if applicable)
- Requested analysis
- Comments or special instructions to the laboratory

Each sample must be assigned a unique sample identification number as described above. The information on the chain-of-custody form, including the sample identification number, must correspond to the information recorded by the sampler on the field forms and field log book and the label on the sample container.

A sample is considered under a person's control when it is in their possession. When custody of a sample is relinquished by the sampler, the sampler will sign and date the chain-of-custody form and note the time that custody was relinquished. The person receiving custody of the sample will also sign and date the form and note the time that the sample was accepted into custody. The goal is to provide a complete record of control of the samples. Should the chain be broken (signed by the relinquished but not receiver or vice versa), the integrity of the sample is lost and the resulting analytical data suspect. Samples must be shipped to the analytical laboratory following the procedures described in in SOP-4. If an overnight shipping service is used to transport the samples to the laboratory, custody of the samples must be relinquished to the shipping service. If possible, have the shipping service sign the chain-of-custody form prior to placing the chain of custody in the sample cooler. If this is not possible (i.e. form placed in the sealed cooler), a note should be included on the chain of custody that the shipping company has received the samples with the chain of custody inside the cooler.

SOP-4

SAMPLE PACKAGING AND SHIPPING

SAMPLE PACKAGING

Samples must be packaged to preclude breakage or damage to sample containers, and shipped under chain of custody, complying with shipper, U.S. EPA, and U.S. DOT regulations. When packaging samples:

- Chain of custody procedures must be strictly adhered to. This applies to sample collection, transportation, shipment and laboratory handling. The COC will provide documentation from collection to analysis.
- Use sample labels from the laboratory whenever possible. Place the sample label on the side of the sample container and use indelible ink when completing the label. Sample containers should be new and stored in an environment free from dust, dirt and fumes.
- Sample should never stand in the sun. After collection and preservation, place labeled sample bottles in a high quality cooler. Place the samples in an upright position inside the cooler and wrap the samples with cushioning material for protection during transport. The cooler should be able to withstand tough handling during shipment without sample breakage.
- Make sure the cooler has an adequate amount of "wet" or "blue" ice (inside sealed Ziploc bags) at all times containers or in them and make sure ice volume is sufficient and appropriate for the season in order to maintain a temperature of 4°C or less inside the cooler from the time the samples are placed in the cooler until they are received by the laboratory. When in doubt put in more ice. Ensure the cooler drain plug is taped shut.
- Fill out the appropriate chain-of-custody forms and place them in a Ziploc bag and tape it to the inside lid of the shipping container. If more than one cooler is used per chain of custody, put a photocopy in the other coolers and mark them as a copy. Commercial carriers are not required to sign the COC, but the tracking number and name of the carrier should be documented on the original cahin-of-custody.
- Close and thoroughly secure the cooler with packing tape.

Purpose

To ensure samples are properly packaged for shipment to the analytical laboratory

Goal and Objective

To have samples received by the analytical laboratory in good condition and within EPA temperature thresholds

Equipment Needs

Indelible ink pen

Chain-of-custody forms

Custody Seals

Sample Labels from Lab

Coolers and Ice

Field Sampling Form

Packing Tape

Bubble wrap/absorbent pads

- Place completed sample custody seals on the outside of the cooler such that the seals will be broken when the cooler is opened. Secure the custody seals on the cooler with clear strapping tape.
- Secure a shipping label with address, phone number, and return address on the outside of the cooler where it is clearly visible. Shipping samples should be coordinated and scheduled to prevent exceeding of hold times or temperature requirements of analytical tests. Check with the lab if there are questions regarding holding times. If Saturday delivery is necessary, confirm with the lab that they will be able to receive the sample delivery before it is shipped.

SHIPPING HAZARDOUS MATERIALS/WASTE

Transportation regulations for shipping of hazardous substances and dangerous goods are defined by the U.S. DOT in 49 CFR, Subchapter C, Part 171 (October 1, 1988); IATA and ICAO. These regulations are accepted by Federal Express and other ground and air carriers.

According to DOT regulations, environmental samples are classified as Other Regulated Substances (ORS). ORS are articles, samples, or materials that are suspected or known to contain contaminants and/or are capable of posing a risk to health, safety, or property when transported by ground or air. Samples, substances, or materials from sources other than material drums, leachate streams, or sludge, should be considered as ORS or environmental samples. Materials shipped under the classification of ORS must not meet any of the following definitions:

Class 1: Explosives; Class 2: Gases- compressed, liquefied, dissolved under pressure, or deeply refrigerated; Class 3 Flammable Liquids; Class 4: Substances susceptible to spontaneous combustion; Class 5: Oxidizing substances; Class 6: Poisonous (toxic and infectious); Class 7: Radioactive materials; Class 8: Corrosives.

If your samples might meet any of the above definitions, contact the project manager to obtain instructions on sample shipment.

SOP-13

SURFACE SOIL SAMPLING

This SOP describes the field equipment and sampling methods for sampling of surface soil. Be sure to review the project specific Field Sampling Plan (FSP) in addition to this SOP.

All sampling equipment must be decontaminated before arriving on site in accordance with SOP-2. All sampling equipment should be decontaminated between collection of samples.

SURFACE SOIL SAMPLING

Commonly, there are two different methods of surface soil sampling completed on a site: Discreet or Grab Samples, and Composite Samples. The methods for each of these are described below.

For both methods, surface soil samples should be collected from the surface to a depth of six inches unless otherwise specified in the project specific FSP. The FSP will outline the appropriate sampling approach for collection of composite vs. discrete samples.

Soils should be described according to the procedures outlined in the United Soil Classification System (USCS; method ASTM D2487) or the Soil Conservation Service (SCS) classification system. Soil texture should be classified by either the USCS or the U.S. Department of Agriculture (USDA) classification. Descriptions shall be recorded in the field books.

Discrete or Grab Soil Samples

- Locate the site as directed in the appropriate FSP. If location is not staked, confirm location with GPS unit.
- Prep sample containers by labelling in accordance with naming conventions outlined in the FSP, and SOP-3.
- Wearing disposable latex or nitrile gloves collect a sample by scraping the 0-6 inch interval of soil with a decontaminated stainless steel spoon or trowel.
- Place the soil in a stainless steel bowl, unless testing of the soil for volatile organic compounds is required. If VOC analysis is required, place representative soil sample directing into sample container.
- If sample is place in a bowl (no VOC analysis), remove all coarse fragments greater than 0.5 inches from the bowl. Remove leaves, grass, and debris from sample.
-

Purpose

Provide guidelines for sampling of surface soil.

Goal and Objective

To employ a method of collecting surface soil samples representative of field conditions.

Equipment Needs

Stainless steel mixing bowl and sampling trowel

Sample Containers

Hand lens (10) power

pH and electrical conductivity meters for soil (if required)

Munsel color book (if required)

Latex or Nitrile gloves

Locating Flags

Coolers and Ice

GPS Unit

Field forms, field book COC

Camera/photo board

- Transfer the soil sample directly from the bowl into a glass sample jar with Teflon cap (4 or 8 ounce, depending on number of analyses required) and store in a cooler at 4 degrees Celsius or less. Retain approximately 30 grams of the sample in a plastic bag for field measurement of pH or PID screening, if required.
- Push a marking flag into the ground at the sample location, which will allow for obtaining the coordinates of the sample location later with a GPS Unit, or take a coordinate reading using the GPS unit prior to moving to another sample location.
- Record information about the sample collection on the appropriate forms in accordance with SOP-1 . Document sample collection and location with photographs.

Composite Samples

Review the FSP to determine the location and spacing of sampling area grids for the collection of composite samples. When reviewing, determine the grid to be cordoned off in the field and the number of composite samples to be collected within the each grid. Follow the process below to collect the composite samples. **Composite soil samples should never be collected for analysis of volatile organic compounds.**

- Prior to collecting composite samples, mark off the sampling grid or detail as described in the FSP. This may include collection of a sub-set of samples within a grid, or subset of samples a set radial distance from a sampling point.
- If sampling within a grid, divide the grid into five to eight (as indicated in the FSP) smaller grids and collect a surface soil sample randomly from within the smaller grid. Sample from each smaller grid should be of equal volume and collected using a decontaminated trowel. Place each composite sample into a mixing bowl. If a sod or duff layer is present, this layer should be peeled back to the top of the mineral soil. Remove all coarse fragments greater than 0.5 inches from the bowl. Mix the composite samples in the mixing bowl and then a fill a laboratory supplied sample container with the mixed soil.
- Push a marking flag into the ground at each of the composite sample locations to allow for obtaining the coordinates of the sample location later with a GPS Unit, or take a coordinate reading using the GPS unit prior to moving to another composite sample location.
- Complete appropriate field sampling forms and the chain of custody in accordance with SOP-1 and SOP-3. Store all samples in a cooler with ice and ship samples in accordance with SOP-4.

SOP-14

SUBSURFACE SOIL SAMPLING

SUBSURFACE SOIL SAMPLING

Subsurface soil sampling is commonly completed using a hand auger, split spoon sampler and drill rig, direct push drilling equipment, or backhoe or excavator. Sampling procedures for each type of equipment is described below. Be sure to review the project specific Field Sampling Plan (FSP) in addition to this SOP. For any subsurface soil sampling event, locate the site to be sampled and ensure that drilling equipment can safely access the site. Minimize off road travel to prevent off site damage to surrounding vegetation. One call utility locate will be called and ticket number recorded prior to initiating any subsurface work below two feet.

Purpose

Provide guidelines for sampling of subsurface soil.

Goal and Objective

To employ a method of collecting subsurface soil samples representative of field conditions.

Equipment Needs

Will depend on sampling method

Stainless steel mixing bowl and sampling trowel

Hand lens (10) power

Munsel color book (if required)

Latex or Nitrile gloves

Locating Flags

GPS Unit

Sample containers

Coolers and Ice

Field forms and field book

Decontamination supplies

Hand Auger

- Arrive on-site equipped with a decontaminated stainless steel auger rod and hand auger. If you intend to collect samples from different intervals below grade, bring several sizes of stainless steel augers (e.g. 2-inch, 4-inch, 6-inch, etc.).
- Hand auger holes can be drilled as one size or in a telescoping manner if you wish to collect discreet samples at intervals below grade and prevent risk of cross contamination between intervals. If a single depth sample is required, advance the auger bucket to the top of the desired sampling interval depth and empty the contents of the auger and remove all cutting from borehole. Decontaminate the auger and advance it to the bottom of the hole and collect a sample. Place the sample in a stainless steel mixing bowl. Mix and place soil into appropriate sample containers.

  For the telescoping method, advance the largest auger first to the desired depth. Collect sample at that depth. Install temporary decontaminated PVC casing with a diameter slightly smaller than the borehole to keep the hole open and reduce possible cross-contamination between depth intervals. Using the next size smaller auger, auger down to the next desired depth and repeat collected of sample at the desired depth.
- Record lithology of soil encountered according to USCS classification system on a boring log.
- Fill out appropriate sample labels, field forms and chain-of-custody paperwork in accordance with SOP-1 and SOP-3.
- Place samples for lab analysis in a cooler with ice and ship according to SOP-4.

- Decontaminate all sampling equipment between sampling sites in accordance with SOP-2.

Split Spoon Sampling using a Hollow-Stem Auger Drill Rig

This SOP does not include procedures for operating drilling equipment. Equipment operation will be subcontracted to a qualified third party that is properly trained.

- Driller should arrive on-site equipped with at least two standard 1.4 inch inside diameter decontaminated split spoon samplers and decontaminated auger flights.
- To collect a sample at depth, driller should advance hollow-stem auger to the desired depth. Driller should remove rod and bit and install split-spoon sampler on end of rod. Driller should then lower rod to desired sampling depth with the hollow-stem auger. Using a 140 pound drop hammer, driller should pound the sampler into the underlying soil, recording the number of blow counts necessary to drive it over the entire length of the sampler (18 inches). Blow counts should be counted for each driven 6-inch interval.
- Retrieve sampler and place on work table. Using the other sampler, repeat this sequence again when driller has reached desired depth of sampling, decontaminating the split spoon in accordance with SOP-2 after every sample.
- Record lithology of soil within the sampler according to USCS classification system on standard boring log. In addition, record the blow counts and percent recovery from cores retrieved from split spoon sampler on the field boring log.
- If required by the field sampling plan, composite like core intervals by mixing soil the soil in stainless steel bowl. When sampling for volatile organic compounds, the sample should never be composited.
- Containerize samples, and follow standard procedures for recording field information, sample labeling, and sample shipment and packaging in accordance with SOP-1, SOP-3 and SOP-4, respectively.
- Decontaminate all sampling equipment between sampling sites in accordance with SOP-2.

Direct Push Drilling Equipment

This SOP does not include procedures for operating drilling equipment. Equipment operation will be subcontracted to a qualified third party that is properly trained.

- Advance sampling rods lined with acetate sleeves to the prescribed depth. Retrieve the rods, remove the sample sleeves, and secure on the work table.
- Record lithology in accordance with USCS standard practices and percent recovery from the retrieved sample sleeve on standard field forms.
- If required by the project work plan or sampling and analysis plan, composite like core intervals by mixing in stainless steel bowl in a similar manner as described for surface sampling (SOP-13). When sampling for volatile organic compounds, the sample should not be mixed.
- Containerize samples, and follow standard procedures for recording field information, sample labeling, and sample shipment and packaging in accordance with SOP-1, SOP-3 and SOP-4, respectively or as outlined in the FSP.

- Decontaminate sampling equipment between each interval sampled in accordance with SOP-2 as required by the FSP. Decontaminate sampling equipment between sampling sites.

Backhoe or Hand Dug Excavations

This SOP does not include procedures for operating heavy equipment. Equipment operation will be subcontracted to a qualified third party that is properly trained. Additional information regarding goals and objectives of test pitting can be found in the SAP.

- Orient excavation to maximize use of the angle of the sun to illuminate the pit for photographs.
- Excavate to the prescribed depth. Place excavated material a sufficient distance from the excavation. Sampling personnel should never enter a pit excavated greater than three feet deep to collect samples, unless the pit is adequately shored and sloped in accordance with OSHA standards. Failure to follow this directive shall be grounds for dismissal from NewFields.
- Soil profile descriptions shall be made for ground surface and of the pit sidewall on standard field forms or in the test pit field log.
- Complete profile descriptions in accordance with USCS standard practices and take photographs before pit is sampled.
- Soil samples shall be collected from depth intervals specified in the SAP. Soil samples should be collected using the excavator bucket. When a depth interval is sampled, soil should be collected from the entire interval exposed on the pit wall by the excavating bucket. When the bucket is brought to the surface, soil samples should be collected from the bucket with a stainless steel trowel, collecting a representative sampling and using extra caution to avoid collecting soil that has touched any portion of the excavator bucket.
- Place soil in a stainless steel bowl and mix thoroughly (this should not be done when analyzing for volatile organics). Containerize mixed soil in appropriate sample containers samples, and follow standard procedures for recording field information, sample labeling, and sample shipment and packaging in accordance with SOP-1, SOP-3 and SOP-4, respectively.
- After sampling is completed, the pit should be backfilled with excavated material in the reverse order that it was excavated so that topsoil material is returned to the top of the pit. When backfilling is complete the area should be cleaned up to its original condition. No test pit should be left open overnight unless temporary fencing and appropriate signs and flagging tape is used to prevent access to the pit.
- Decontaminate the excavator bucket and all sampling equipment between sampling sites in accordance with SOP-2. Excavation equipment should be steam cleaned between sites with hot water after visible dirt and mud has been physically removed.

SOP-22

MANAGEMENT OF INVESTIGATIVE-DERIVED WASTE

Prior to the field sampling event, review the Sampling and Analysis Plan to understand how wastes generated during the investigation should be handled. This standard operating procedure is applicable to non-hazardous wastes. If hazardous wastes may be generated, please consult with the project manager and the Field Sampling Plan (FSP).

SOIL

Whenever possible, soils excavated from test pits should be placed back in the test pit in the reverse order that it was excavated.

To determine appropriate methods for handing of drill cuttings from soil borings or monitoring well installation, soils exhumed from the borehole should be monitored for staining and field screened for VOCs using a PID in accordance with standard operating procedures. Based on the PID screening, cuttings with organic vapor concentrations greater than 100 ppm should be containerized in labeled 55-gallon drums (or roll-off containers if large volumes of cuttings are anticipated) pending further characterization. Alternatively, project personnel may elect to containerize all drill cuttings based on the presence of known contamination and anticipated contaminant concentrations. Containerized soil must be properly labeled, documented and disposed of in accordance with state and federal regulations based on of soil analytical results.

Soil that does not appear to be contaminated based on observations by field personnel and PID screening may be spread on the ground near the point of origin.

Purpose

To outline the procedure for handling wastes generated during site investigation

Goal and Objective

To employ a method for appropriate handling investigative-derived wastes that limits contamination of the environment

Equipment Needs

PID

Field Forms and field book

DOT approved 55-gallon drums

Drum wrench

GROUNDWATER

Groundwater purged from a well during development or sampling that has a sheen or contains free product must be containerized in an appropriately labeled 55-gallon drums or tank pending receipt of analytical results. A drum should be dedicated to each well sampled so that the analytical results of the groundwater sample from the well can be used to characterize the water in the drum. If groundwater from several wells is placed in a drum, the water in the drum should be sampled for adequate characterization. The containerized water must be disposed of in accordance with state and federal regulations based on the analytical results. Groundwater that does not have a sheen or contain free product or other know contamination may be discharged to the ground surface in the vicinity of the well location for evaporation and infiltration. All surface discharge areas should not allow for migration of discharge water to a surface water body.

RINSEATE WATER ORIGINATING FROM DECONTAMINATION

All source water for sampling equipment decontamination purposes will be distilled water. For larger equipment when power washing procedures are used for decontamination, potable water will be used. Decontamination will be conducted in a specified area that limits the spread of decontamination water. Decontamination water will be discharged to the ground in the vicinity of the source of dirt and mud to evaporate and infiltrate.

APPENDIX B

Contaminated Soil Management Plan

Contaminated Soil Management Plan

PCB-Impacted Soil in Operable Unit 2

Former Frenchtown Mill
14577 Pulp Mill Road
Frenchtown, Montana

Prepared for:

M2Green Redevelopment, LLC
210 Market Street
Alton, IL 62002

International Paper Company
6400 Poplar Avenue
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P.O. Box 4098
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NewFields

August 2017
Project 350.0065.000

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1.0 INTRODUCTION

This Contaminated Soil Management Plan (CSMP) describes the methods that will be employed to safely remove Polychlorinated Biphenyl (PCB)-contaminated soil from Operable Unit 2 at the Former Frenchtown Mill (site, **Figure 1**) and disposed of the soil at the Republic, Inc. landfill in Missoula, Montana (**Figure 2**). The plan is intended to guide oversight personnel and excavation/hauling contractors on how to manage the contaminated soil to minimize impacts to health, safety, and the environment.

1.1 PURPOSE

The purpose of this CSMP is to:

- Summarize the locations where PCB-impacted soil is designated for excavation within OU2 at the site;
- Outline the roles and responsibilities for personnel involved in the soil response actions; and
- Detail the proposed disposal methods for contaminated soil, including the appropriate control measures to minimize environmental and human health risks.

A copy of the approved CSMP will be kept on site during the soil excavation activities.

1.2 ROLES AND RESPONSIBILITIES

Individuals having key roles during the PCB-impacted soil excavation in OU2 are shown in **Table 1-1**.

Table 1-1: Key Personnel

Personnel	Representing	Primary Role	Contact Information
David Tooke	NewFields	Construction Manager	(406) 240-8360
Wilhelm Welzenbach	NewFields	Field Supervisor	(406) 529-2577
Sara Sparks	EPA	Regulatory Oversight	(406) 491-4016
Larry Dears	EPA Contractor	Regulatory Oversight	(406) 548-8396
Keith Large	DEQ	Regulatory Oversight	(406) 444-6569

David Tooke, Project Coordinator for the Frenchtown Mill Project, will be the Construction Manager and will be responsible for implementation of the CSMP including training personnel in the required procedures, and coordination of work by contaminated site specialists. He will also be responsible for liaison with regulatory personnel at the Environmental Protection Agency (EPA) and Montana Department of Environmental Quality (DEQ).

Mr. Wilhelm Welzenbach will be the Field Supervisor, and will be responsible for implementation of the soil response actions consistent with this CSMP and the Health and Safety Plan (HASP). In this role, he will:

- Ensure compliance with the HASP, including facilitation of safety meetings each day prior to beginning work;
- Oversee the excavation activities, directing the contractor hired to excavate and haul contaminated soil to the landfill;
- Advise on classification of excavated material for disposal;
- Collect soil confirmation samples upon completion of soil excavation activities; and
- Document all work activities in accordance with the EPA-approved Quality Assurance Project Plan (QAPP) dated November 2015, and Addendum 5 to the Remedial Investigation Work Plan dated August 2017.

1.3 Summary of PCB-Impacted Soil Proposed for Excavation

There are two areas in OU2 where PCB-impacted soil is proposed for excavation. These are referred to as the High Density Pulp Tank (HDPT) and the Transformer Storage Building (TSB) areas (**Figure 1**). Investigation in these areas identified PCBs in soil at elevated concentrations. In the HDPT area, only Aroclor 1260 was detected. In the TSB area, Aroclors 1254 and 1260 were detected.

Results for PCBs in soil of OU2 are summarized in **Table 1**. PCB concentrations in soil were above the residential direct-contact Regional Screening Levels (RSLs) in surface soil (0 to 2 feet below ground surface (bgs)) in samples SS18, SS19, HDPT38, and HDPT40 in the HDPT area, as well as surface soil samples SS28, TSB46, and TSB47 in the TSB area. Soil with elevated concentrations of PCBs is the target for the response actions. More details on excavation depths, site-specific cleanup levels, and confirmation sampling is presented in Addendum 5 to the Remedial Investigation Work Plan.

2.0 SOIL EXCAVATION AND DISPOSAL

2.1 RESPONSE ACTION PLANNING

All personnel involved in soil excavation and disposal will undergo a project awareness and health and safety training. Prior to beginning of field work, a pre-earthwork site meeting will be held and attended by personnel involved with the response actions to discuss the risks and site procedures for handling contaminated soil from point of generation to the Republic, Inc. landfill in Missoula, Montana.

2.2 EXCAVATION AND DISPOSAL

The Field Supervisor will oversee the excavation work and be responsible for site safety and defining which materials are clean and may remain on site, and which are contaminated and therefore require disposal offsite. Access to the excavation area shall be restricted to authorized personnel. Clean overburden soil, if any, will be stored on an impermeable concrete or asphalt surface pending use as backfill. Any overburden soil or imported soil used to backfill the excavation must be tested for polychlorinated biphenyls (PCBs), and shown to meet residential RSLs prior to use as backfill.

Soil to be hauled offsite will be loaded directly onto trucks, and will not be stockpiled. To prevent inadvertent contamination during transport of PCB-impacted soils, the wheels on each truck will be dry decontaminated in a designated area prior to leaving the site, and the excavator bucket will be dry decontaminated prior to movement away from each excavation area. If dry decontamination is not sufficient due to wet conditions or caking of material on the truck tires, a wet decontamination will be performed on the concrete slab for the Transformer Storage Building Foundation (**Figure 1**), which has a closed sump to collect decontamination water. To dispose of the water, it will be periodically pumped onto the soil in the truck and hauled to the landfill. This will be done in a manner whereby the soil is not liquefied and no water is discharged from the truck en route to the landfill.

All trucks leaving the site en route to the landfill will be tarped to prevent loss of soil during transport. The route trucks will follow to the Republic, Inc. Class II landfill in Missoula, Montana is shown in **Figure 2**.

2.3 ONSITE DUST CONTROL

Dust suppression will be implemented during the excavation work. Elements of the dust suppression shall include:

- Reducing vehicle speeds to a maximum of 10 miles per hour;
- Minimizing drop heights from loaders;
- Orienting excavation and loading work so that no personnel will be located downwind; and
- Wetting on-site haul roads and the excavation area, if needed.

NewFields personnel will monitor the work to ensure dust suppression activities are being implemented and visible dust is minimized in excavation areas or along onsite haul roads.

2.4 Spill Contingency Plan - Transport of Soil to Landfill

This section outlines the steps to be taken, if there should be a release of contaminated soil during transport to the landfill. The risk of spill is low, and the following procedures will be followed to prevent vehicular accidents and spills of contaminated soil during transport to the landfill:

- Use the route from the site to the landfill shown on **Figure 2**.
- Use trucks that are maintained on a regular basis and are in good condition. Those having tailgates that are damaged such that soil may be released during transport will not be used. A visual inspection of each truck prior to it leaving the site will be conducted.
- Ensure that the truck is decontaminated and tarped prior to leaving the site.
- Maintain speeds at or below the speed limit at all times.
- Have a cell phone or radio to contact appropriate personnel in the event of an accident and/or potential for release of soil to the environment during transport.
- Restrict the use of cell phones (including texting) while driving.

Should soil be released during hauling, or there is a vehicle accident with the potential for a release of soil, the truck driver shall immediately contact 911 to report the accident. Following this call, the truck driver shall contact David Tooke, Construction Manager, at the phone number on **Table 1-1**. If for some reason he is not available, Chris Cerquone at NewFields shall be contacted at (406) 830-6102. One of these individuals will immediately notify the client and EPA of the incident, and respond to the incident. Upon arrival on the site of the accident, the following actions will be taken to prevent further release of contaminated soil:

- The nearest storm drain, if any, will be sealed to ensure storm water that has or may come in contact with soil does not discharge into the drain. If there is no drain, straw bales, straw wattles, or other sediment control structures should be used to prevent release off of the roadway.
- Soil will be removed from the incident site and disposed of at the Republic, Inc. landfill. If the contaminated soil was spilled on a paved surface, the paved surface shall be cleaned using a street sweeper and all collected material shall be disposed of at the landfill. If the contaminated soil has left the roadway, and/or rainwater potentially mobilized contaminants to soil on the shoulder of the road, approximately 0-6 inches of the soil in the spill area shall be removed and disposed of at the landfill. Should soil in the shoulder of the road be removed, confirmation sampling will be performed to verify that the remaining soil is not contaminated with PCBs.
- The NewFields responder shall maintain contact with regulatory personnel during all response actions and document all actions taken to address the situation.

FIGURES

P:\350.0065.M2Green\AGIS\Projects\2016_RIWP_Addendum\FIGURE 2 - Proposed Sample Areas.mxd Revised 7/28/2017

Aerial Photo Source: Newfields 2016

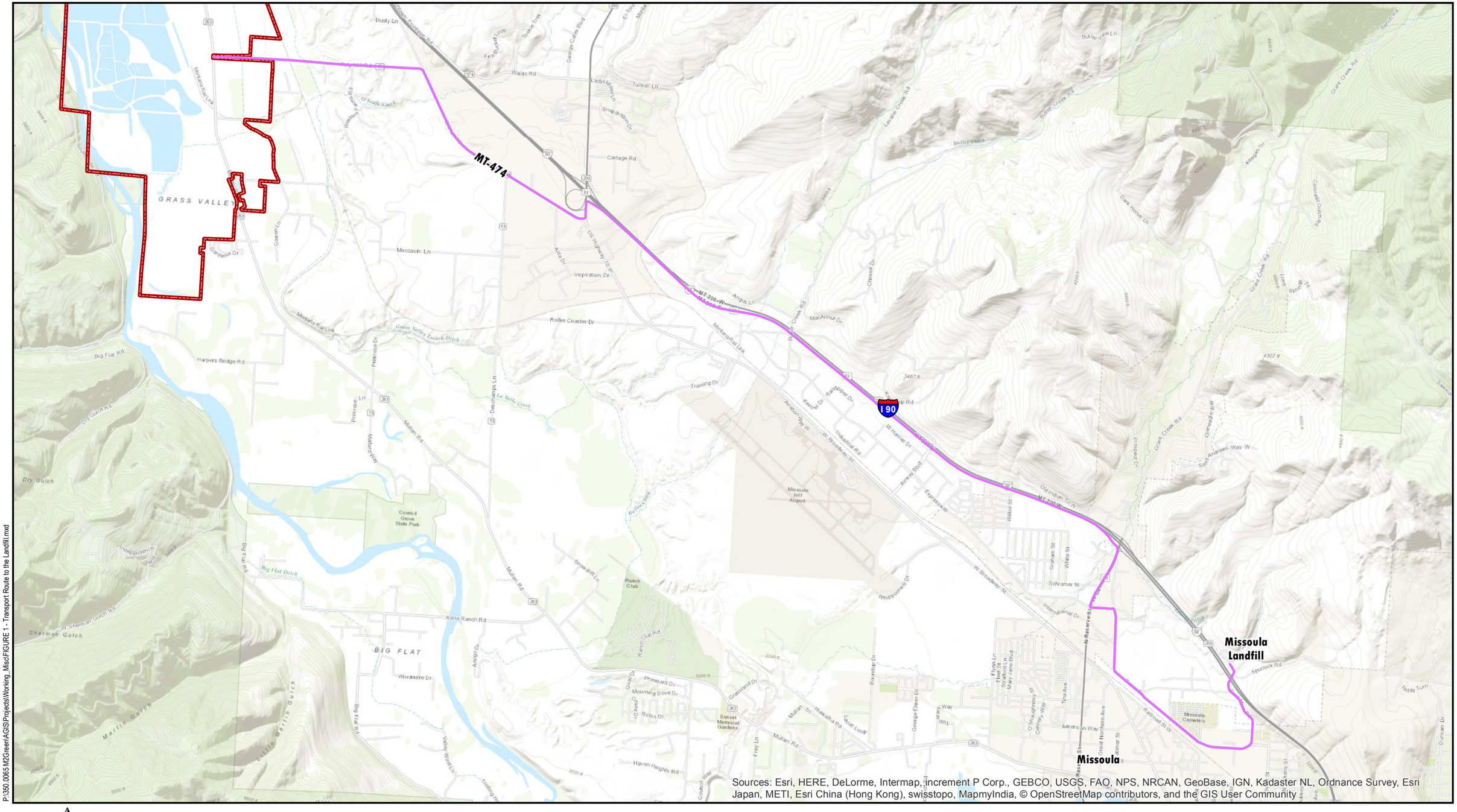
N

0 200
Feet

OU2 - Industrial Area Boundary

NewFields

PCB Impacted Areas (OU2)
Former Frenchtown Mill Site
Missoula County, Montana
FIGURE 1



P:\350.0065 M2Green\AGIS\Projects\Working_Misc\FIGURE 1 - Transport Route to the Landfill.mxd

0 Feet 4,000

NewFields

Haul Route to Landfill

Mill Site Boundary (Approximate)

Transport Route to the Landfill
Former Frenchtown Mill Site
Missoula County, Montana
FIGURE 2

TABLES

TABLE 1
Summary of Soil Sample Results By Depth
PCB Investigation (OU2)
Former Frenchtown Mill, Missoula County, Montana

SAMPLE ID	High Density Pulp Tank (HDPT) Area							Transformer Storage Building (TSB) Area										
	Soil Sample							Soil Sample										
	SS18-IN-(12) SS19-IN- (24)	IN-HDPT38-SB-1,2,3,4	IN-HDPT39-SB-1,2,4,6	IN-HDPT40-SB-1,2,3,4	IN-HDPT41-SB-1,4	IN-HDPT42-SB-1,2,4,5	IN-HDPT43-SB-1,2,5,6	SS28-IN-(0-2)c	SS29-IN-(0-2)c	SS30-IN-(0-2)c	SS31-IN-(0-2)c	IN-TSB44-SB-1,2,3	IN-TSB45-SB-1,2,3	IN-TSB46-SB-1,2,3	IN-TSB47-SB-1,2,3	IN-TSB48-SB-1,2,3	IN-TSB49-SB-1,2,3	IN-TSB50-SB-1,2,3
	Inside Ring				Outside Ring													
SAMPLING DEPTH (feet) 1	**1440** ND	614	42.9	70.7		H	H	**7490 J**	154 J	37.7 U	88.1 J	15.2	ND	66.7	ND	H	H	H
2	**1740** ND	126	ND	747	65.8	H	H					14.8	H	156	893	H	H	H
3		**1020**																
4		17.1J										H	H	H	H	H	H	H
5			**2840**		172	H												
6			**1470**	125		H	H											
7				50.3			H											
8																		
9																		
10																		

Notes:

156 - Blue font; Aroclor 1254 concentration in µg/kg, if not shown, result is ND with reporting limig of 34.5 µg/kg

1020 - Black font; Aroclor 1260 concentration in µg/kg

H - Held, not analyzed

HDPT - High Density Pulp Tank

TSB - Transformer Storage Building

Sample depths are based on professional judgment due to poor sample recovery in sampling sleeve.

Sample locations are shown on Figure 3 (HDPT) and Figure 4 (TSB)

ID - identification

J - Concentration is considered estimated.

ND - Not Detected

QA/QC - Quality Assurance/Quality Control

µg/kg - micrograms per kilogram, or parts per billion

OU - Operable Unit

- initial soil samples collected in 2015

- soil samples collected in 2016

- not investigated

Bold - exceeds the construction worker direct contact screening level of 990 µg/kg (Aroclor 1260) or 970 µg/kg (Aroclor 1254).

Underline - sample from 0 to 2 feet, and exceeds residential direct contact screening level of 240 µg/kg (Aroclor 1260) or 120 µg/kg (Aroclor 1254).

..... depth driven by sample sleeve

____ total depth of borehole

APPENDIX C
Field Forms

FIELD FORMS	
#	**Description**
1	Daily Field Record
2	Test Pit Field Form
7	Photo Log
8	Incident Report Form
9	Pace Analytical – Chain of Custody
11	Field Investigation Form

DAILY FIELD RECORD

Page_____ of _____

NewFields
Perspective. Vision. Solutions.

Project and Task Number:	Date:
Project Name:	Field Activity:
Location:	Weather:

Personnel: Name	Company	Time in	Time Out

PERSONAL SAFETY CHECKLIST

	Steel-toed boots		Hard Hat		Traffic Vest
	Gloves		Safety Goggles		Ear Protection

TIME	DESCRIPTION OF WORK PERFORMED

DAILY FIELD RECORD

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Page______ of ______

Date:______________________

TIME	DESCRIPTION OF WORK PERFORMED

NewFields

Pit ID: _____

Project: _____ Project #: _____

Project Location: _____ Date: _____

Equipment: _____ Contractor: _____ Logged by: _____

Lat/Long (N/E): _____ Elevation: _____ Total Pit Depth: _____

Shoring (if used): _____ Surface Condtions: _____ Backfilled: _____

Depth	Sample (depth & type)	Pit Wall Profile Profile of face (refer to plan view of pit below): _____ Profile Width = _____	Description	Additional Notes

Legend:

SD	Small disturbed sample
LD	Large disturbed sample
ST	Thin-walled tube sample (vert / horz.)
BL	Block sample
ρ	In-situ density test
ω	Water content
▽	Water table encountered

Plan View of Pit: (include width, length, and North direction)

PHOTOGRAPH LOG

Page______ of ______

NewFields
Perspective. Vision. Solutions.

Project and Task Number:	Date:
Project Name:	Field Activity:
Location:	

ID#	Time	Direction of View	Subject of Photograph
1			

INCIDENT REPORT
Occupational Accident, Injury, or Illness

1. *Employee Name:* _____

2. *Employee No.:* _____ 3. *Office location:* _____

4. *Job title:* _____

5. *Home address:* _____

6. *Phone number:* _____

7. *Sex:* ☐ *M* ☐ *F* 8. *Date of birth:* _____

9. *Type of incident:* ☐ *Exposure* ☐ *Physical injury*

10. *Address where incident occurred (include county):* _____

_____

11. *Date and time of incident:* _____

12. *Date incident was reported:* _____ *To whom:* _____

13. *What were you doing when injured? (Be specific identify tools, equipment, or materials you were using.)*

_____

_____

14 *How did the accident or exposure occur? (Describe events fully. Tell what happened and how it happened. Use additional sheets if needed.)*

_____

_____

15. *Object or substance that directly injured you:*

_____

16. *Describe the injury or illness (e.g., cut, strain, fracture, skin rash):*

_____

17. *Part of body affected:* _____

18. *Did you receive medical care?* ☐ *Yes* ☐ *No* *If so, when?* _____
By whom? (Name and address of physician/paramedic/hospital.)

_____

_____

If hospitalized, name and address of hospital:

_____

_____

19. *Did you lose time from work?* ☐ *Yes* ☐ *No* *If so, how much?* _____

20. *Have you returned to work?* ☐ *Yes* ☐ *No* *If so, date returned:* _____

21 *List anyone else affected by this incident.*

_____

_____

22 *List any witnesses to this incident.*

_____

_____

_____ _____

Signature *Date*

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

Section A **Required** Client Information:

Company:	
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B **Required** Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name:
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER_____

SITE LOCATION ☐ GA ☐ IL ☐ IN ☐ MI ☐ NC ☐ OH ☐ SC ☐ WI ☐ OTHER____

Filtered (Y/N)

Requested Analysis:

Section D **Required** Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

SAMPLE CONDITIONS

	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	
Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

Field Investigation Form

Project Name:

Date:

Project Number:

Investigation Date(s):

Project Address:

Project City:

Site Contact:

Client Contact:

EPA/DEQ Manager:

Required Check Offs	**Yes**	**No**
DEQ/EPA Approved SAP		
SAP Reviewed		
Utility Locate Number		
Owner Notified		
Health & Safety Plan		
Sample Location Map		
Holding times work		

Overall Reason For Investigation

Number of Hours Approved for Sampling Effort (include all that apply)

Task	Hours	Notes
ACM/LBP Inspection		
Soils Investigation		
Groundwater Sampling		
Other		

Sampling Methods

# of Samples	Analytical Parameters	Media	Natural or QC Sample?	Method #	Containers	Preservative	Hold Time	Sample Locations

Lab Pack

Laboratory

Shipping by:

Standard Operating Procedure	SOP #

Other Instructions

Project Manager:

Site Investigator:

NewFields